7 Application Management

This chapter describes Team CGI-AMS's proposed methodology for the management of the enterprise applications introduced via the Virginia Enterprise Applications Architecture (VEAA) Initiative. This chapter responds to portions of the Commonwealth's Enterprise Business Architecture's Information and Technology Management component that we analyzed during Due Diligence.

We propose an Enterprise Applications Management Center of Excellence of all new enterprise applications, and an option to transition current legacy application management to the Center.

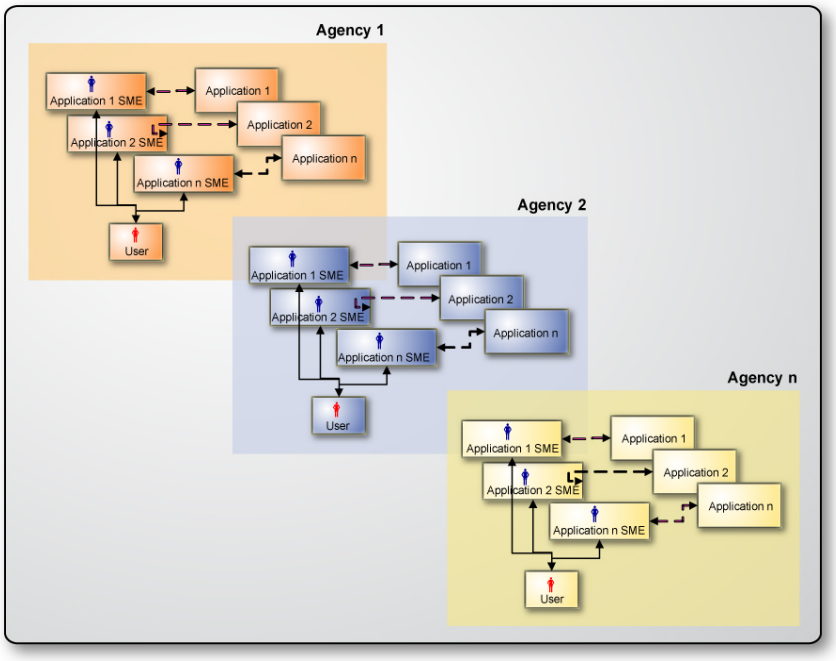
The Commonwealth of Virginia will soon embark upon a journey of change that will further enhance the state's leadership and recognition as one of the best managed states in the country. During this transformation, many existing applications will be partly or wholly replaced by enterprise applications proposed elsewhere in this document.

To support this change, Team CGI-AMS proposes two facets of application management. First, we propose to provide the applications management and support of the new enterprise applications introduced by the VEAA Initiative. Second, if the Commonwealth desires, we will assume the management and support of applications that will be impacted or retired by the enterprise applications introduced by the VEAA Initiative.

7.1 As-Is Applications Support Environment

Today's support environment is depicted in Exhibit 7-1.

Exhibit 7-1 Current Application Management Model



In this model, applications are maintained within each agency, separately and disparately from each other—even though many of these applications have the same base system, such as PeopleSoft or Oracle. As a result, the state cannot take advantage of economies of scale or load balancing of resources. Also, operating the existing applications in a "business as usual" environment increases the cost, schedule, and risk of the migration from the old to the new. Because the migration to the new enterprise solutions is likely to be performed over some period of time, opportunities exist to reduce the ongoing support costs for the legacy applications still in use.

7.1.1 Characteristics of Current Environment

As part of the Due Diligence effort, a survey was distributed to a sample of Commonwealth agencies, with 42 agencies responding.[1] From this data, we learned that 36 agencies have 252 enterprise applications in scope for this Initiative. These are maintained by 115 state employees and 28 contractors, but these resources are not evenly distributed. As shown in Exhibit 7-2, seven agencies have 60 percent of the applications management staff reported.

Exhibit 7-2 FTE Distribution

Agency	Number of FTEs
Virginia Department of Transportation	31
Department of Mental Health	15
Virginia Department of Corrections	11
Department of Human Resource Management	8
State Police	7.5
Department of General Services	7
Department of Administration	7
Total	**86.5**

As shown in Exhibit 7-3, survey results show the various technologies that agencies use.

[1] During April-June 2005, a staff team from the Commonwealth of Virginia, IBM, and CGI-AMS designed, developed and executed Due Diligence research to gather information on 19 business functions in four business areas of the Commonwealth's Enterprise Business Architecture: administrative management, financial management, human resources management, and supply chain management, with the supporting function of application management. The team conducted a set of foundation interviews with key subject matter experts, administered electronic surveys to a sample of 46 agencies, and conducted a series of follow-up discussions with respondents. The team also used data generated by Commonwealth systems and research entities to validate survey information provided.

Exhibit 7-3 Surveyed Technologies

Technology	Number of applications	Comments
Oracle	37	▪ Oracle – Includes Oracle 11i ERP and custom built applications ▪ Oracle 11i is used in six agencies, at different levels of customization in each agency ▪ PeopleSoft (mainly used at VDOT and DGS)
SQL server	23	
Access & VB	55	
Cobol	15	
Java	12	
Mapper	11	▪ Mainly State Police Access & VB (55 applications)

7.1.2 Cost of Current Environment

From the data received in the survey, Team CGI-AMS estimates the annual cost of the current environment (budget baseline) to be approximately $17.4 million, as shown in Exhibit 7-4. Please note that only people and real estate costs were taken into consideration in this amount. Also, some figures were taken directly from the Due Diligence survey while others were based on assumptions.

Exhibit 7-4 Cost of Current Environment Calculation

Type of FTE	Number of FTEs	Average salary/cost ($)	Benefit cost factor (%)	Real estate ($/sq ft)	Number sq ft per FTE
State employees	115 (1)	64,112 (3)	30.51 (6)	20 (7)	125 (7)
Contractors	28 (1)	235,000 (4)	N/A	20 (7)	125 (7)
Management	7.15 (2)	93,000 (5)	30.51 (6)	20 (7)	125 (7)

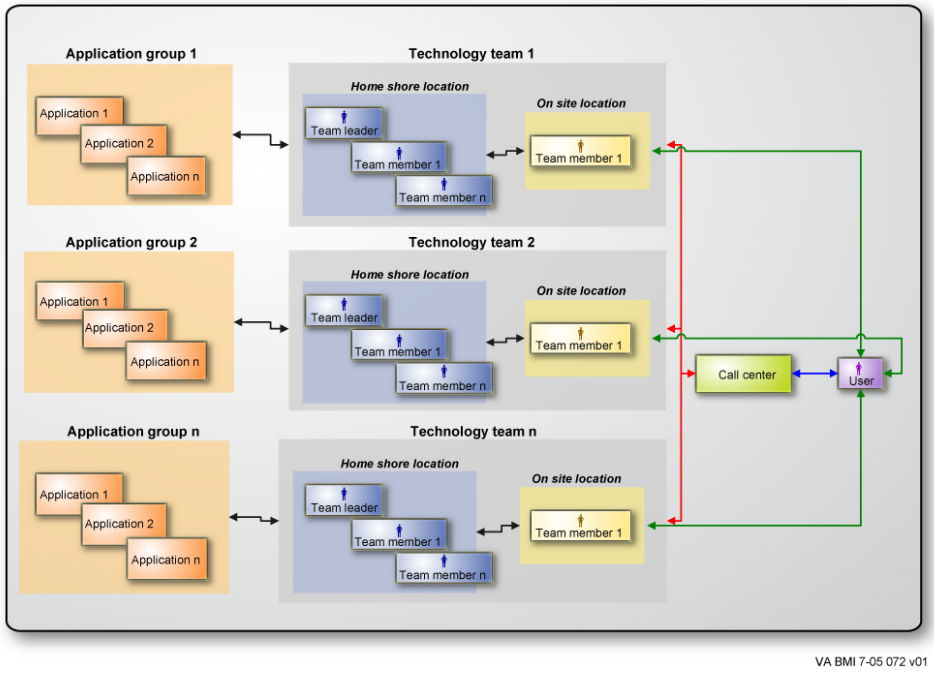
(1): From the web survey
(2): Average management layer of 5% (from the Commonwealth HR web site)
(3): Weighted average of each band salary median from the survey (unloaded)
(4): Yearly estimated contractor cost (235 days per yr @ $1000 per day)
(5): Average management salary from Commonwealth HR web site (unloaded)
(6): Estimated benefit factor in accordance with Commonwealth regulations
(7): Assumption in accordance with industry standards

Calculation of annual cost: ((115 x 64 112) + (7.15 x 93 000) + 28 * 235 000)) + ((115 + 28 + 7.15) x 20 x 125) + (((115 x 64 112) + (7.15 x 93 000)) x 0.3051)= **$17.4 M** (current baseline)

7.2 Proposed Environment

Team CGI-AMS proposes to consolidate application management for those applications supporting the Financial, Human Resource, Administrative, and Supply Chain Management towers. Exhibit 7-5 provides a high level overview of the proposed future state of application management.

Exhibit 7-5 Future Application Management Model



The consolidation will be delivered through a Center of Excellence staffed with teams that support Commonwealth applications and application specific technologies (for example, COBOL running on the mainframe or Oracle running on UNIX).

The Center of Excellence could offer application management under either scenario: providing all new enterprise applications only as they come online, or taking over existing applications now and managing the transition to replacement new applications into the future.

7.2.1 Applications Management Benefits

CGI-AMS is currently managing thousands of applications for an extensive number of customers operating in various business sectors. Our processes and methodologies enable us to manage application portfolios efficiently, thus allowing us to provide the Commonwealth with better services at significantly less cost. In general, there are several key benefits to the Commonwealth from this approach:

- Flexibility of resource usage and costs, allowing the Commonwealth to rapidly increase or decrease resource levels in response to enterprise needs

- Improved service (quality and service levels to end users)
- Low risk entry into new technologies and services
- Realize economies of scale through the centralization of the applications management staff for multiple agencies under one umbrella
- Reduce the cost of resources by in-sourcing work that is currently performed by subcontractors
- Consistent deployment and operation
- Improved information sharing, which enables improvements in productivity
- Improved speed of delivery of new applications or content
- A common service management delivery model.

7.2.2 Center of Excellence Model

Our Center of Excellence model will use two locations: one onsite in Commonwealth government, and one offsite at a Team CGI-AMS Virginia location.

One of the best ways to achieve the Commonwealth's goals in delivering applications management services is to put in place a structure where resources are located in a "two-location" model. Some of the resources will be physically located onsite in Commonwealth premises and others could be located remotely at a Team CGI-AMS location elsewhere in Virginia. Team CGI-AMS has used the following guidelines to distribute activities between the two locations:

- Application management services that require direct communication with the client and end users (such as analysis, user testing, and acceptance testing) would be delivered onsite in Commonwealth locations.
- All other activities could be performed offsite in another Virginia location. Most of the coding and unit testing activities and fixing of defects and application changes will be done from the remote location, and the majority of documentation-related activities will be performed remotely.

Team CGI-AMS's proposed resource distribution between the onsite and remote locations during the term of the contract will be on the order of 30 percent onsite and 70 percent remote. Team CGI-AMS believes that the onsite/remote percentages are achievable without compromising existing quality or desired service levels. Team CGI-AMS will be validating the stability of the applications during Due Diligence and will finalize the distribution of work between the two locations.

With this Center of Excellence approach, the Commonwealth will achieve specific advantages:

- **Lower cost of operation.** We will deliver guaranteed savings to the Commonwealth.
- **Risk mitigation on loss of application knowledge.** We will apply our application management methodology in support of application cross-learning within application teams.
- **A smooth transition from legacy applications to the new enterprise solutions.** As new solutions are implemented, resources performing maintenance on the decommissioned legacy applications can be redirected to perform tasks such as testing and data conversions. In this approach, they will be introduced to the new solutions and can then be a part of the application management teams supporting the new solutions.

- **Application management team scalability.** When the new solutions are implemented, Team CGI-AMS will adjust the size and the skill mix of the application management team as required.
- **Enhanced overall application management standards.** Development, release, configuration, testing and change control standards.

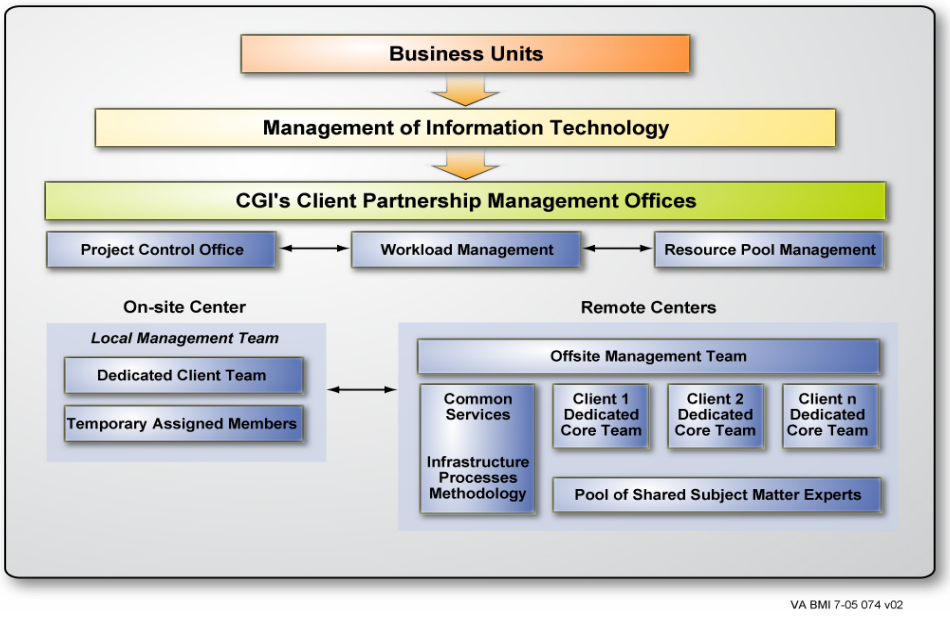
This Center of Excellence could be located anywhere in the Commonwealth, such as in Southwest Virginia, creating economic opportunity in an area of the state with chronic business underinvestment.

7.2.2.1 Functional Model

Virginia's "Business Units" define the business needs that guide Team CGI-AMS's Application Management process. Team CGI-AMS will work with the Commonwealth to translate business requirements into measurable service level agreements (SLAs) and performance targets that become the foundation of Team CGI-AMS's commitment to its clients, setting key metrics and ensuring accountability.

Exhibit 7-6 shows the means by which workflow moves among the elements of the Center of Excellence model.

Exhibit 7-6 Functional Model



The onsite resources will represent the combined efforts of the local management team, a dedicated client team of Team CGI-AMS members, and temporarily assigned members (as required to augment the on-site team with specialized skills or consulting services). The onsite resources coordinate ongoing workflow with the offsite management team.

Team CGI-AMS's remote Center of Excellence combines both client-specific resources, to preserve the client's knowledge and skills, with functional and industry experts, to leverage a shared pool of expertise across the center. The

ongoing interface between these teams, managed by the offsite Management Team, combines the best of the client's IT resources with the skills and scale of Team CGI-AMS.

The Center of Excellence's Project Control Office (PCO) is responsible for all project-related critical management issues such as scope, risk and overall status tracking across all in-flight client projects. The PCO manages these issues across the development lifecycle, from preliminary analysis, through design and build phases, to implementation. Workload and resource pool management teams monitor ongoing performance of individual projects in terms of quality, planning, resource management and on-site/off-site coordination. They liaise with the PCO through daily and weekly calls and Team CGI-AMS status reports. Change requests, estimates, and schedule changes are escalated up from the PCO to the client's Business Unit.

7.2.2.2 Governance

We structure each Application Management relationship to meet our client's unique business goals and to improve flexibility to meet current and future needs.

CGI's flexible Delivery Model enables our clients to reduce costs and improve performance while maintaining control over the strategic direction of their application management environments. We structure each relationship to meet our client's unique business goals and to improve flexibility to meet current and future needs. To each relationship, we bring the following distinctive benefits:

- **Customized delivery.** Our solution provides a highly efficient, cost competitive model delivering services based on the Commonwealth of Virginia's specific business needs.
- **Flexible client partnership.** Personalized partnering approach places emphasis on the Commonwealth's return on investment. We will recommend, counsel, support and deliver services that align with and adapt to the Commonwealth's changing business requirements while leaving the Commonwealth in control of its strategic direction. Team CGI-AMS will work with the Commonwealth to assist in updating its IT Strategy Plan annually.
- **Quality management frameworks.** Anchored by our Client Partnership Management Framework (CPMF), Team CGI-AMS will provide optimized processes and disciplines to the Commonwealth. CPMF is CGI's proprietary intellectual capital, and is the basis of how CGI manages its relationships with its clients. A rigorous, regular program to evaluate the satisfaction of our clients allows us to measure our progress and continuously improve our practices. Each year, CGI establishes improvement objectives based on the results obtained from the previous year. The CPMF It will provide the Commonwealth with the foundation upon which it will receive the metrics desired, ensuring that technology requirements are clearly defined, that projects are properly scoped and that the necessary resources are applied to meet objectives, service levels and on-time delivery.
- **Continuous improvement.** A monthly dashboard report will provide the information the Commonwealth needs to make ongoing business decisions as well as assurance that contracted services levels are being met. CGI's Client Satisfaction Assessment Program (CSAP) will provide the Commonwealth with a mechanism to constantly improve the quality of the services delivered.

- **Attractive financial proposals.** Competitive pricing with contract flexibility that allows for changes in services and the environment, enabling the Commonwealth to move from a fixed cost to a variable cost structure. CGI's diversified service offering will provide the Commonwealth with cost savings during economic uncertainty, but facilitate investments during economic growth; enhancing the Commonwealth's ability to effectively serve its constituents.

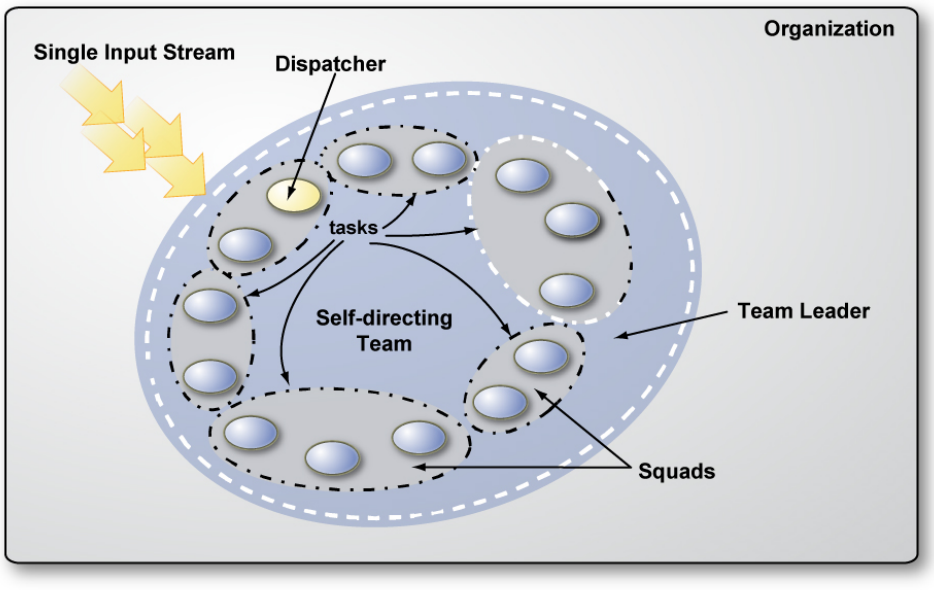
7.2.2.3 Workflow Methodology

The Team CGI-AMS model for application management is foremost a workflow methodology for software maintenance. The model relies on self-directed teams to enhance the process and increase its returns. Self-directed teams are not unique to this model. However, the model provides a unique and proven process and structure for enabling and sustaining high levels of performance.

7.2.2.3.1 Self-Directed Teams

Our model relies on self-directed teams that are responsible for managing their own work, with the goal of efficiently managing software maintenance processes. Team members plan and work in squads, obtain assignments from dispatchers, document their work, and operate as a single unit. As illustrated in Exhibit 7-7, within broad parameters, organizational goals, and priorities, the team sets its own schedules and determines when changes and strategies are required in order to perform set objectives. Teams are trained to use the model effectively and receive ongoing coaching to optimize their performance. Instruction and coaching are very intense initially, and diminish over time as teams become more self-sufficient.

Exhibit 7-7 Self-Directing Team Organization



Within the team, individuals work in squads of two or more, and are either driving (doing the job) or riding (checking and supporting the driver). There are several squads operating simultaneously. The dispatcher negotiates assignments with squads, thus facilitating a smooth and balanced completion of tasks, while promoting cross-learning. Dispatching is a peer role whose workload is adjusted in order to devote sufficient time and energy to the dispatch job. Some teams have dispatch squads; hence extra work does not fall on only one person, and as such there is always a backup ready to step in and dispatch when required. It is important to have a backup dispatcher to fill in when the dispatcher is sick, on vacation, or on travel.

The team leader is not typically involved in day-to-day operations. Team leaders frequently lead two or more teams and perform important interface roles with other teams and the client. They assist their teams in setting and tracking performance objectives, and support and advocate for teams whenever and wherever possible. Team leaders also play a crucial role in managing personnel and performance.

7.2.2.3.2 Team Configuration

Our solution provides for dedicated teams that complement one another:

- The Emergency, Corrective and Preventive (ECP) maintenance team essentially handles all production support activities (e.g., break/fix, monitoring, etc.).
- The Application Perfective (AP) maintenance team takes care of all minor enhancements.
- The Systems Integration and Development (AD) team handles all major development activities including the implementation of the new enterprise applications. Post-implementation ECP and AP support for the new enterprise applications will be performed by the teams described above.
- The Application Administration (AA) team coordinates and organizes all the activities of the three other teams.

7.2.2.3.3 Methodologies

Each team has its own set of customized processes that tie into the overall delivery model, and they have access to a wide array of Team CGI-AMS methodologies that are tailored to various types of projects, either maintenance or new development, and to specific technological environments.[2] All these methodologies and processes are ISO- and SEI CMM-compliant.

In all cases, our methodologies provide guidance in the following areas:

- Project Management
- Project Iteration
- Requirements Management

[2] For example, CGI-AMS's process for organizing ECP and AP activities is based on the Peritus methodology. The main objectives of Peritus are to ensure a close day-to-day monitoring of issues resolution, to foster knowledge distribution among team members, and to allow for the collection of detailed application maintenance metrics that support our productivity improvement initiatives.

- Analysis
- Design
- Coding
- Unit, Integration, and System Testing
- Configuration Management
- Quality Assurance
- Environment Management
- Deployment
- Transition
- Sustaining and Support
- Training.

7.2.2.3.4 Processes and Workflows

Team CGI-AMS's application management services for the Commonwealth take advantage of best practices.

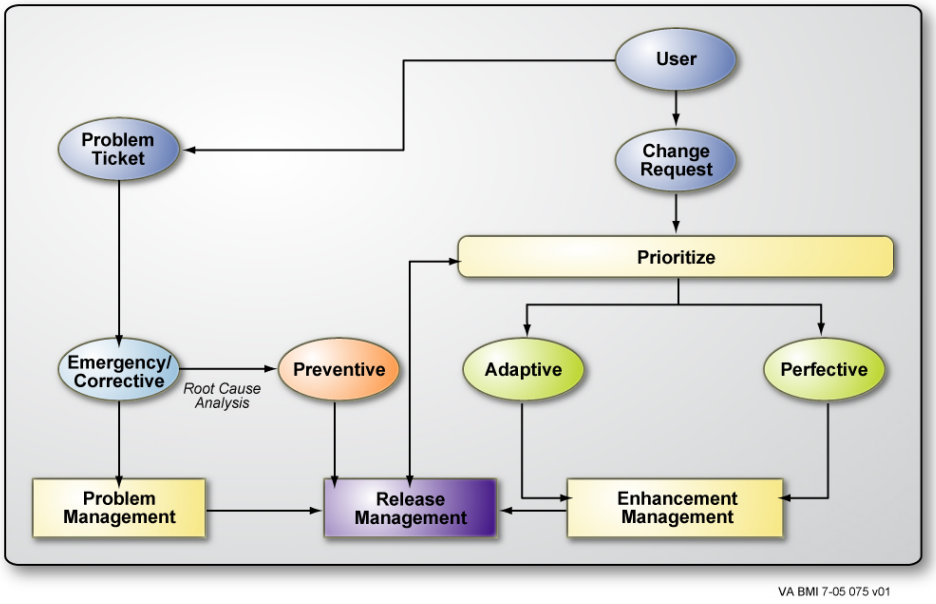
Team CGI-AMS's application management services for the Commonwealth take advantage of best practices. Described below are some of the processes and workflows on which our application management services practice is based.

Team CGI-AMS defines the various subdivisions of the application management services as follows:

- **Application Management Services** refers to emergency, corrective, and preventive maintenance: Incidents related to application components or functionalities that were working yesterday and are not working today (such as errors in payroll system, data errors, etc.).
- **Application Enhancements** refers to adaptive and perfective maintenance: Minor evolution to existing applications with effort less than 100 hours and which may or may not affect the functionality of the application (i.e., adding a new report, updating a table, etc.).

For application enhancement requests, a single point of contact at the Commonwealth locations will play a major role in gathering and analyzing the information received from the Commonwealth. Using Team CGI-AMS's application management services tool, C2®, a centralized database will be updated and will prioritize the request, assign the appropriate Team CGI-AMS team, control the activities, and maintain the status of each request. Exhibit 7-8 summarizes the information flow from a user perspective.

Exhibit 7-8 Ticket Workflow



The C2 tool has been designed to interact with Team CGI-AMS's maintenance process, based on the Peritus methodology. These tools and processes are already in use by CGI-AMS at numerous other client locations.

7.2.3 Service Level Management

If the Commonwealth chooses to transfer legacy applications management, Team CGI-AMS will perform the services at least at the same level and with the same degree of accuracy, quality, completeness, and responsiveness as was provided prior to the effective date of the Agreement.

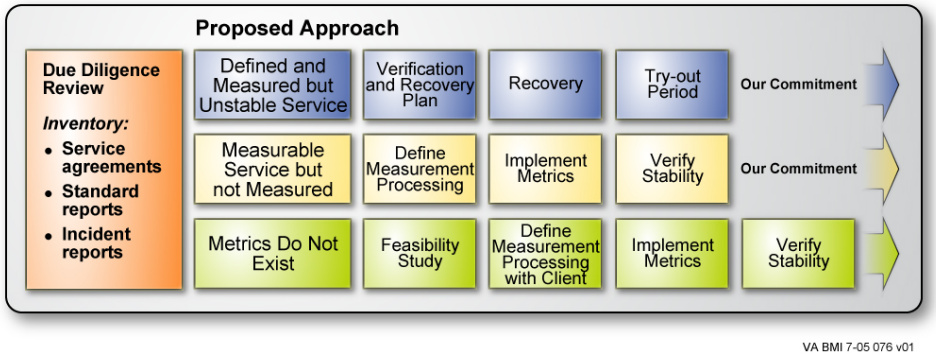
If the Commonwealth chooses to transfer management of legacy applications to Team CGI-AMS, we will take over the support and operation of those applications "as is" with existing processes and tools. Where appropriate, Team CGI-AMS will then begin to introduce our proven practices to the current environment.[3]

Team CGI-AMS is committed to delivering the highest quality of service while meeting the service levels on all activities under its control. Team CGI-AMS will perform the services at least at the same level and with the same degree of accuracy, quality, completeness, and responsiveness as was provided prior to the effective date of the Agreement.

Where service levels are not already in place or the target levels are not currently being achieved, Team CGI-AMS will follow the processes shown in Exhibit 7-9.

[3] The service levels will be based on the assumption that all components (hardware, software, operating system, tools, database, middleware, etc.) are under an adequate support contract.

Exhibit 7-9 Service Level Implementation Process



It is standard CGI-AMS Business Practice to develop Service Level Agreements (SLAs) jointly with the customer. This joint development is a multi-stage process, which follows CGI's process framework (based on ITIL). This begins with establishing Service Level Requirements (SLRs), followed by a stabilization period in which Service Level Objectives are targeted and, finally, the SLAs are established. This practice makes certain that a balance exists for both the Commonwealth and Team CGI-AMS whereby the Commonwealth gets SLAs tailored to its specific needs and systems without having to over-engineer the solutions.

The following sections describe aspects of this approach and Team CGI-AMS's approach to Service Level Management in more detail.

7.2.3.1 Definitions and Concepts

An SLA is an agreement that defines the parameters of services delivered by the service provider to the users of a system. The SLA Definition process ensures that, prior to contractually committing to an SLA, the partners validate that the SLA addresses the users' needs and can be met by the service provider.

CGI-AMS uses a proven process to go through the many activities involved with SLA Definition, starting with the Service Level Requirement. The SLR identifies, for each service area or function, the services, the target service levels, and the reporting requirements.

For any given service area or function, the SLA additionally defines the service measures and measurement processes; roles and responsibilities; what constitutes a failure to meet the SLA and the consequences; and the he procedures for monitoring, reporting, and reviewing the delivered services.

7.2.3.2 SLA Control

Continuous monitoring of service levels provides for accurate analysis, quick corrective action, and high customer satisfaction.

Though most of the SLs are reported on a monthly basis, many are measured either daily or weekly and reported on only at the end of the calendar month. But whether an SL requires daily, weekly, or monthly measures, continuous monitoring by the Team CGI-AMS client coordinator is done in cooperation with the individuals in charge of service delivery teams in each service area. As soon as variations, which could lead to non-compliance with any given SL, are detected, a synergy meeting including all individuals associated with delivery of

that service is scheduled and a diagnostic process is launched. If the SL threshold has already been violated, the client coordinator notifies his customer counterpart.

During the monthly operational reviews with the Commonwealth's representatives, the different service levels will be discussed and any solutions put in place during the month will be brought to the table. For more serious situations, action plans will be presented to the customer for approval, either at the monthly meeting or at special meetings organized for a given situation. Depending on the cause of the problem and the nature and scope of the best solution, impacts on the current SLs as well as cost-related issues (for the solution itself or for future monthly charges) may also need to be discussed with all those involved.

Monthly operational reviews or ad hoc meetings may be scheduled to allow for a review of major incidents and of problems being addressed as well as for discussions of change requests being worked on and any other special project currently under way.

7.2.3.3 SLA Deviations

Team CGI-AMS puts an emphasis on the problem and incident resolution processes with prompt restoration of service and clear escalation procedures up to the highest level of Management in order to ensure visibility and prompt response to any incidents based on gravity and priority.

If any service levels are not being met, Team CGI-AMS will systematically meet with key service users' representatives to review the situation, and present its analysis as well as corrective measures being considered. Should any change have an impact on the current agreement beyond the scope of the change management process, a formal proposal would be delivered to the Commonwealth with the nature and justifications for the changes.

In addition to the operational review meetings held every month, ad hoc meetings can be scheduled at any time by the Commonwealth or Team CGI-AMS managers to discuss any arising issue.

7.2.3.4 SLA Reporting

SLA Reporting will be established in the first few months of transition and outsourced operations. CGI-AMS's approach for SLA Reporting typically includes the following reporting formats:

- Monthly reports of actual performance for all Service Levels (SLs)
- Monthly meetings between the customer and CGI-AMS representatives to review and discuss all key aspects of operations under the outsourcing agreement, including SLs, incidents, and change requests.

In order to report on SL achievements, Team CGI-AMS will create a customized report that will ensure that all items for each SL are compared to the performance goals. The reports will be produced on a monthly basis and verified by the Team CGI-AMS client coordinator and will have all the details mentioned in the SLA.

7.2.4 Application Commissioning/Decommissioning

Should the Commonwealth transfer management of the legacy applications to Team CGI-AMS, we will partner with the Commonwealth to provide an orderly migration from old to new. As applications get closer to being replaced or decommissioned, enhancements to those applications will tend toward zero. The hours that would otherwise be used by the team supporting the existing application are then available for participation in the development of the new enterprise applications (mainly in data conversion and testing tasks). Participating in the development of the new applications has the added benefit of preparing the team to take over maintenance on the new enterprise applications.

7.2.5 Transition of Existing Systems

We understand the magnitude, complexity, and importance of the transition activities that are necessary to transfer the maintenance of in-scope applications to Team CGI-AMS. If the Commonwealth chooses to transition their legacy application management to Team CGI-AMS, depending on the number and size of the applications transitioned, the transition should be completed in no more than nine months after the day we assume responsibility. Team CGI-AMS would manage the transition like a project and minimize the impacts to day-to-day operations.

Team CGI-AMS's overall approach to legacy application management transition combines people, process, results, and technology dimensions into one integrated and coherent program of activities. Our proven tTransition methodology includes comprehensive Transition Plans and Risk Mitigation Plans.

The biggest challenge with assuming the management of any legacy applications is achieving a complete knowledge transfer from current Commonwealth employees and contractors. To facilitate any transition, Team CGI-AMS personnel will be paired with current application subject matter experts (SMEs) for a period of time that will allow complete knowledge transfer of the application. This process typically occurs over a period of time, gradually assuming responsibility for additional legacy systems as determined by the Commonwealth.

7.2.6 Migration Effectiveness for New Systems

Critical to the success of new systems is a thorough understanding of the existing application functionality and data stores that will be migrated to the new enterprise solutions. Consequently, the Commonwealth and its partners must prepare wisely for these migrations. These preparation activities are required to yield the most efficient and cost-effective migrations:

- Identifying gaps, omissions, and errors in documentation and correcting them to ensure all business requirements as implemented are documented and known prior to migration.
- Cross-training on application and business knowledge to ensure that knowledgeable resources are available to support migration activities.
- Training new resources on legacy applications to mitigate the attrition risk that the Commonwealth is facing with its current demographics—an issue that is further compounded by the fact that many of the legacy applications

that support the towers in-scope are staffed by very knowledgeable but few resources. Often one resource is supporting just one application.

- Implementing industry standard lifecycle methodologies and processes to ensure that the best quality of data is available at migration time.

Additionally, Team CGI-AMS will implement its proprietary Management Frameworks, processes, tools, and lifecycle methodologies. Disciplined utilization of the frameworks, processes, tools and methodologies will enhance the ability of the Commonwealth and Team CGI-AMS to complete the migration of legacy applications to the new enterprise solutions.

7.2.7 Summary

The Commonwealth of Virginia will receive the same end user-focused, highly professional services that agencies currently experience with their own IT teams.

With Team CGI-AMS managing the day-to-day, in-scope application maintenance operations, the Commonwealth of Virginia will keep full control over all strategic decision and will receive the same end-user focused, highly professional services that agencies currently experience with their own IT teams. Our approach will enable development standards, configuration management, and release management at a price that will be significantly below the actual baseline for the application maintenance management of all in-scope applications.

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